REMARKS

Claims 69-72 and 74-86 are in the case and presented for reconsideration. Claims 69 and 83 have been amended. No new matter has been added.

Claims 69-72 and 74-86 have been rejected under 35 U.S.C. § 103 (a) as being unpatentable over U.S. Patent 4,821,731 (Martinelli et al.) in view of U.S. Patent 5,558,091 (Acker et al.) and U.S. Patent 5,588,432 (Crowley). With respect to this rejection, the Examiner has stated:

> Martinelli et al. disclose a medical system including a catheter 20 having a distal portion 24 for applying laser energy for ablation, an ECG monitor, and position sensing means for sensing the position of the catheter distal end (see columns 7-10). One means used by Martinelli et al is magnetic means for determining the orientation of the catheter tip. Ultrasound means are used to determine tip position. Acker et al disclose the use of magnetic fields to determine both the position and orientation of a probe tip. It would have been obvious to one skilled in the art to have modified Martinelli et al such that magnetic fields are used to determine both position and orientation as disclosed by Acker et al. Such a modification merely involves the substitution of one known means for determining position for another and reduces the type of system parts by using the same means to perform two functions (both the function of determining position as well as orientation). It is a well-known expedient in the art of ablating cardiac tissue to provide electrode means as part of the device in order to map the electrical activity of the heart prior to ablating the tissue. An example of such is taught by Crowley. It would have been obvious to one skilled in the art to have further modified Martinelli et al such that the distal end of the catheter includes means for sensing the electrical signals generated by the heart and the device includes means for mapping the electrical activity of the heart using the sensed signals as taught by Crowly. The advantage of such is to enable the physician to determine where the ablation should be carried out on the heart tissue. With respect to claim 82, Crowley discloses a catheter for image and ablation in the heart that includes a means for steering the catheter to the desired location within the body. It is a well known in the art that positioning a catheter within the heart of a patient requires controlling the catheter by bending or rotating the tip of the catheter. Therefore, it would have been obvious to one skilled in the art to have further modified Martinelli et al such that it includes a means for steering the catheter within the body in order to ensure safe and accurate positioning of the catheter as is well known in the art and taught by Crowley.

Claims 69 and 83 have been amended in order to more clearly point out the functionality of the signal processor as identified in the Examiner's "Response to Arguments".

With respect to the above-outlined rejection, the Applicant traverses as follows. First, the Applicant would like to emphasize that Applicant's claimed invention for the system (Claim 69 amended) and method (Claim 83 amended) comprise a combination of novel features and function (for the system) and combination of novel method steps (for the method) that are simply neither described, suggested or even inferred in any of the cited prior art references.

For instance, Martinelli et al. fails to teach, suggest or even infer numerous features and functions associated with the Applicant's novel claimed invention. First, Martinelli et al. does not teach or suggest a position sensor that uses magnetic fields in order to determine both position and orientation coordinates of the distal end of the catheter. It is important to note that the Martinelli et al. device requires both the use of an ultrasonic transducer 60 which generates an ultrasound signal for use as means for generating a reference signal (Column 7, Lines 36-41) in addition to electromagnetic radiation for transducer 34 (Column 9, Lines 24-35). Thus, Martinelli et al. teaches a "means for generating reference signals" that require both an ultrasound transducer and an electromagnetic radiation transducer in order to determine position. Accordingly, the Martinelli et al. device is entirely incapable of using magnetic fields alone in order to determine the exact location of the catheter distal end (to include both the position and orientation of the catheter distal end). Moreover, the Martinelli et al. device lacks any ability to provide position and orientation coordinates of the catheter distal end such as uniquely found with the Applicant's claimed present invention.

Another deficiency in the Martinelli et al. reference is that there is no mention of any active portion capable of sensing electrical signals generated on the heart. Applicant notes that the Martinelli et al. device is directed specifically to a device for ablating arthrosclerotic lesions from portions of the coronary arteries. See Column 6, Lines 19-24.

Furthermore, there is absolutely no teaching or suggestion that can be found in Martinelli et al. that is directed toward reconstructing a three-dimensional surface representing a surface of the patient's heart based on the signals received from the position sensor, i.e. a magnetic field position sensor capable of generating signals for determining both position and orientation coordinates.

Additionally, the Martinelli et al. device provides for no ability to generate a map on a three-dimensional surface showing sensed electrical signals generated by the heart, (for instance provided by an active portion capable of sensing electrical signals generated on the heart such as uniquely found with the Applicant's present invention).

Crowley is directed toward catheters for imaging, sensing electrical potentials and ablating tissue and is limited to a system that specifically utilizes acoustic imaging only. Additionally, Acker et al. is directed toward a system for magnetic determination of position and orientation of a probe, and more particularly, directed toward providing a representation of a probe superimposed on a separately acquired image. Clearly, both of these prior art references are distinctly removed from the combination of novel features and the combination of novel method steps associated with the Applicant's claimed present invention as amended.

Accordingly, it is clear that the Examiner has not established a prima fascia case of obviousness and that none of these prior art references, either alone or in combination with each other, teach all of the novel features in combination for the Applicant's novel system (Claim 69 and the dependent claims therefrom) and all of the novel method steps in combination for the Applicant's novel method (Claim 83 and the dependent claims therefrom). Accordingly, based on the numerous shortcomings found in the teachings of these cited prior art references, it is clear that the Applicant's own disclosure is being used as a blue print and that the Examiner is clearly applying hindsight in reaching this rejection.

Accordingly, by this Amendment and for the reasons detailed above, the Applicant's claimed present invention is neither anticipated by nor rendered obvious by the cited prior art references and favorable action is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is/are captioned "Version with markings to show changes made".

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Please amend Claims 69 and 83 as follows:

Claim 69. ([Three] Four Times Amended) A system for percutaneous treatment of a patient's heart, comprising:

a catheter, the catheter having a proximal end and a distal end;

an active portion at the distal end of the catheter for sensing electrical signals generated on the heart and for applying laser energy operable to ablate a portion of the heart;

a position sensor responsive to magnetic fields for generating signals for determining position and orientation coordinates of the catheter distal end; and

a signal processor for receiving the signals from the position sensor and reconstructing a three-dimensional surface representing a surface of the patient's heart based on the signals received from the position sensor and for generating a map on the three-dimensional surface showing the sensed electrical signals generated by the heart.

Claim 83. ([Three] Four Times Amended) A method of treating a patient's heart comprising the steps of:

(a) percutaneously inserting a catheter into a heart of a patient, the catheter having a proximal end and a distal end, an active portion at the distal end of the catheter for sensing electrical signals generated on the heart and for applying laser energy, and a position sensor responsive to magnetic fields for generating location signals;

(b) generating magnetic fields;

(c) using the position sensor to generate location signals based on the generated magnetic fields;

(d) sensing the position of the catheter distal end based on the location signals generated by the position sensor for determining position and orientation coordinates of the catheter distal end at a number of places on a surface of the heart by touching the catheter distal end on the surface at each place;

(e) using the position sensor to reference the catheter distal end based on the position and orientation coordinates;

(f) reconstructing a three-dimensional surface representing the surface of the heart based on the location signals generated by the position sensor;

(g) sensing electrical signals generated by the heart;

(h) mapping the electrical activity of the heart on the three-dimensional surface using the sensed electrical signals;

(i) positioning the catheter such that its distal end is adjacent tissue of the heart to be treated based on the position and orientation coordinates; and

(j) applying laser energy from the active portion to the patient's heart tissue.